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A REVIEW OF THE EIGHTH DECENNIAL REVISION OF THE PHARMACOPŒIA OF THE UNITED STATES OF AMERICA.

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The long delayed, and anxiously awaited, eighth decennial revision of the Pharmacopœia of the United States of America has finally been published, and, according to a decree imprinted on the title-page of the book, is to be the official authority on all matters pharmaceutic on and after the first day of September, 1905.

As an appropriate introduction to a review that will be limited, as much as possible, to a comparison of the changes that have been made, with the general principles involved in the instructions given the revision committee by the National Convention of 1900, it may be permissible to quote the introduction to a somewhat similar review, printed in this Journal seventy-five years ago (A. J. P., Vol. II, page 316), on the occasion of the publication of the first revision of the Pharmacopœia of the United States of America, in the city of New York, in 1830.

The review itself is unsigned, but was probably written by the editor, Dr. Benjamin Ellis, at that time the Professor of Materia Medica and Pharmacy in the Philadelphia College of Pharmacy. He says:

> If there be any department of learning in which a spirit of severe criticism may be laudably indulged it is in the examination of such a work as a Pharmacopœia. The preparation of a "code of medicines" is, in the present state of science, a task requiring microscopical minuteness of research, accurate learning, and extensive practical knowledge. Europe may be said to abound in Pharmacopœias of great merit, suited to the uses of particular districts. Each

of these contains, in addition to what may be called the common stock of medicines, that peculiar to its own locality, and therefore marking it with distinctive characters.

Neither is there any want of works of great learning and value upon the natural and chemical history of drugs. Some of the most eminent natural philosophers of the age have not thought it beneath them to illustrate the science of pharmacy by their labors; and there is therefore no excuse left but indolence or ignorance, for any gross errors in so important a work as a Pharmacopœia.

The skill displayed in its compilation may for this reason be viewed by strangers as no unfair index of the state of science in the community which is satisfied with the performance; for in a work requiring, not extraordinary talent, but patience, research, learning and accuracy, we may rest assured that the skill which the public sentiment requires will soon be brought to the task.

We are therefore disposed to examine every work of the kind which issues from our press with jealousy and to give it a close scrutiny, and we seize the present, which is our first opportunity of vindicating the rights of the JOURNAL of the College of Pharmacy to sit in judgment upon so important a matter.

Much that is said in the succeeding twenty pages that are devoted to the review of this, the first, revision of the U.S.P., would apply equally well to the recently published eighth decennial revision of the same book, as the two have many points in common.

The first revision, as does the one before us, includes doses.

The first revision, as does the eighth, represents, for the science of pharmacy, a marked step in advance.

The first revision of the U.S.P. was put to press in five months from the date of the meeting of the delegates in June, 1830; the present, eighth revision, has required more than five years.

The first revision was thoroughly, and somewhat severely, criticized, and it is to be hoped that the eighth revision will be criticized even more thoroughly, though less severely and with a greater degree of moderation.

The privilege assumed by the editor of the AMERICAN JOURNAL OF PHARMACY, three-quarters of a century ago, to sit in judgment on authoritative works of this kind has, since then, been repeatedly exercised, and each succeeding decennial revision of the Pharmacopœia of the United States of America has been critically reviewed for the purpose of pointing out its shortcomings and its weaknesses. This criticism has always been presented, not for the purpose of depreciating, or detracting from the popularity of the book, but with the idea of interesting all classes of pharmacists in the necessity of improving the work and thus induce them to contribute their obser-

vations and experiences for the purpose of making the succeeding revision more perfect and more acceptable than the present.

It is with this same purpose in mind that the present review of the general principles involved in this, the eighth, revision is presented, as a forerunner of other more detailed criticisms of the same book. For more than two decades the Pharmacopœia of the United States of America has admittedly been ranked among the most satisfactory, the most practical, and the most scholarly of the various pharmacopœias of the world. Of neither the revision of 1880 nor of 1890 could it be said that the committee having the revision in charge, attempted, in any way, to ignore the plain instructions that were given them by the respective National Conventions, and while it has been asserted that the resulting Pharmacopœias were too highly scientific in character it must be admitted by all who have the interests of American pharmacy at heart, that it was directly due to this highly scientific character of our national standard that American pharmacy has made the progress that it has in the last fifteen or twenty years. That the present, eighth, decennial revision should represent a distinct step in advance, even on the admittedly admirable Pharmacopœia of 1890, was to have been expected, particularly in view of the advances that have been made in all branches relating to the science of Pharmacology. In many respects this expectation, justified as it was, is fully met, if not exceeded, by the committee on revision, who, particularly in connection with the chemistry of the book, present us with a very large number of tests and descriptions that should do much to place this revision at the head of all similar works of reference. For the painstaking work that they have done in connection with the book the members of the committee amply deserve and should duly receive the unreserved and hearty thanks of the physicians and pharmacists of the country.

That the same book, despite the five years of painstaking work that has been expended on it, would not, and practically could not, meet with universal approbation was also to be expected, and the present revision committee will undoubtedly welcome any and all criticisms and suggestions that are made for the purpose of improving on the scientific character, general usefulness and adaptability of the Pharmacopœia, as a guide and reference in future decades.

The whole book, as published, comprises a total of more than 760 large 8vo pages, well printed on an excellent quality of paper.

In the general style of its make-up it closely resembles the Pharmacopœias published by the revision committees of 1880 and 1890. The materia medica of the new Pharmacopœia is comprised in 510 pages and includes a total of 957 titles, 33 less than are found in the Pharmacopœia of 1890 and 40 less than were included in the Pharmacopœia for 1880.

The general trend of the articles in the several revisions is well shown in the appended table, giving the comparative number of the drugs and preparations, in these several revisions, compared with the list of articles included in the latest edition of the German Pharmacopœia.

TABLE NO. I.—GIVING COMPARATIVE NUMBER AND VARIETY OF ARTICLES INCLUDED IN THE THREE MOST RECENT EDITIONS OF THE U.S.P. AND IN THE GERMAN PHARMACOPŒIA FOR 1900.

	U.S.P. 1880.	U.S.P. 1890.	U.S.P. 1900.	Phar Germ. 1900.
Vegetable	264	255	220	177
Animal	15	18	21	15
Chemical	233	239	267	178
Galenical	481	473	443	234
General formulas	4	5	6	23
Cross references	—	—	—	1
Total	997	990	957	626

From a comparison of these figures it will be seen that while the actual as well as the comparative number of the official vegetable drugs has decreased, the drugs of animal origin have slightly increased. Articles of a chemical nature have increased very decidedly and there is a corresponding falling off in the number of galenical preparations. The number of general formulas has been increased but slowly in the U.S.P., and in this particular our National Standard is certainly far behind the German Pharmacopœia, which, as may be noted above, includes no less than 23 general formulas or descriptive articles or headings.

This lack of general headings, particularly in view of the instructions given the committee in paragraph 6 of the general principles to be followed in revising the Pharmacopœia, is greatly to be deplored and constitutes one of the questions that should be very freely discussed and commented on with a view of obviating any similar action by the revision committee that will be appointed in 1910 to go over and if possible improve on this present edition.

Some Pharmacopœial Problems.—As a fitting prologue to the revision of the Pharmacopœia of 1890, the then chairman of the Committee on Revision, Dr. Charles Rice, contributed a paper on the subject of pharmacopœial problems to this JOURNAL (A. J. P., 1899, page 558). In this paper Dr. Rice outlined what to him appeared to be problems of sufficient interest to be worthy of general discussion. The innovations and additions that were suggested by him, in this particular paper, were practically all adopted, so that much of what is new in the present Pharmacopœia may be directly traced to the foresight and suggestions of the late chairman of the Committee on Revision.

The absence of several of the distinctive features of the earlier Pharmacopœias, particularly the omission of the list of preparations in connection with official drugs, will be a marked disappointment to many and will do much to detract from the value of some of the new additions.

In discussing the uses that the medical profession might have for a pharmacopœia, Dr. Rice, in the paper quoted above, says:

"The main objects which a physician usually has, or would have, for consulting a pharmacopœia are to ascertain:

"(1) What form or forms of administration are officially available in the case of a certain drug?

"(2) What is the strength of the respective preparations?

"(3) What are the ordinary doses?"

In the sixth and seventh decennial revisions a physician could readily find an answer to the first two questions but not to the third. In the present, eighth decennial, revision the answer to the third question is supplied, but the information formerly included as an answer to the first, and really most important, of these questions has been entirely omitted.

The omission is all the more unfortunate as the Committee on Revision offers no adequate substitute and does not even mention why the lists of preparations, formerly included, have been so unceremoniously dropped.

In addition to being a readily accessible and generally reliable source of information for the physician, these lists of preparations were also of considerable interest to the pharmacist as a readily-referred-to guide to the official preparations of any particular drug. To the student, these lists were especially valuable, as they enabled

him to become familiar with the names of the different official preparations in which the several articles were used as component parts.

As noted above, the Committee on Revision does not appear to have taken cognizance of the absence of this particular feature, and as no direct mention is made concerning them, in the instructions given the committee by the National Convention, it is just possible that they have been inadvertently overlooked.

Scope of the Pharmacopœia.—To men who are actively engaged in following up the advances and the needs of the science of medicine, it is becoming more and more evident that a pharmacopœia, to be acceptable and satisfactory to the community for which it is designed, must, in addition to a proper consideration of the articles that are more or less distinctive of local conditions, take cognizance of the tendency to recognize international standards for such drugs and preparations as are known and used in a greater number of the civilized countries of the world.

That the national convention of 1900 was imbued with a realization of this particular necessity is evidenced by the tone and the character of the instructions embodied in the "General Principles to be Followed in Revising the Pharmacopœia." That a majority, at least of the members of the Committee on Revision, have not been awakened to, or at least have not been sufficiently impressed by, this evident necessity for international standards for the more widely used drugs and preparations, is evidenced by the rather indifferent way in which many of the clear and definite instructions to the Committee on Revision have been carried out. One of the shortcomings in this direction, but by far not the greatest, is to be found in the committee's attempt to solve the admittedly intricate problem connected with the admission of "synthetized products of definite composition."

With the rapid dissemination of scientific facts that is possible at the present time, there is an ever-decreasing necessity for giving any particular heed to purely local demands for official recognition of any particular substance or preparation. When, on the other hand, widely-known and widely-used preparations are recognized, some attention should be directed to the requirements, uses, names and limitations of these same preparations in other countries.

The recognition of the so-called synthetic chemicals, constituted

as Dr. Rice pointed out in the paper quoted above, a peculiarly difficult problem. This problem is made still more intricate by the varying laws and regulations that exist in the different countries relating to proprietary rights in patents and trade-marks.

To illustrate some of the complications and differences that future revision committees will have to contend with it may be well to compare the trade and the accepted chemical name of several of these newly-admitted synthetic preparations with the official titles that are given them in the new U.S.P., the B.P. and last edition of the German Pharmacopœia.

Antipyrine. Phenyldimethylpyrazolon.
U.S.P. Antipyrina.
B.P. Phenazonum.
Ger. Phar. Pyrazolonum phenyldimethylicum.

Chloralamid. Chloralformamide.
U.S.P. Chloralformamidum.
Ger. Phar. Chloralum formamidatum.

Phenacetine. Par acetphenetidin.
U.S.P. Acetphenetidinum.
B.P. Phenacetinum.
Ger. Phar. Phenacetinum.

Sulphonal. Diethylsulphonedimethylmethane.
U.S.P. Sulphonmethanum.
B.P. Sulphonal.
Ger. Phar. Sulfonalum.

Trional. Diethylsulphonemethylethylmethane.
U.S.P. Sulphonethylmethanum.
Ger. Phar. Methylsulfonalum.

Doses.—The instructions embodied in the "General Principles to be Followed in Revising the Pharmacopœia," under the sub-heading "Doses," direct that the Committee on Revision "state the average approximate (but neither a minimum nor a maximum) dose for adults, and, when deemed advisable, also for children. The metric system to be used, and the approximate equivalents in ordinary weights and measures inserted in parenthesis." In executing these indisputably plain and explicit instructions, the members of the Committee on Revision cannot be said to have followed them too

closely. They have, as the result of their labors, presented us with a list of "average approximate doses, in the metric system," that will do almost anything but popularize the metric system of weights and measures with the majority of physicians and pharmacists of the United States.

In this connection it would be interesting, indeed, to discover by what manner of reasoning the members of the Committee on Revision were enabled to come to the conclusion that 0.065 of opium more nearly represented an average dose than 0.050; or how and why 0.125 of a given drug should be considered approximately nearer to an average dose than 0.100 of the same substance. To any reasonable individual it would certainly appear that if the members of the Committee on Revision had given the average dose of pharmacopœial articles in full, round decimal quantities, in place of stating, as they practically do, the exact metric equivalents of the average dose in the ordinary weights or measures, they would have, more nearly at least, complied with the spirit as well as the letter of their instructions. The members of the Committee on Revision have seen fit to go even further. In addition to the ludicrous figures that they have given us as representing the average doses of drugs in metric quantities, they have also included, in the introductory notices to the book, a table of approximate measures that in addition to being manifestly incorrect, is not in keeping with any attempt to popularize or to increase the use of the metric system of weights and measures. Here it may be added that with the single exception of "The Pharmacopœia of the New York Hospital," published in 1816, no other representative American pharmacopœia has ever taken cognizance of approximate measures; and while the Pharmacopœia of the New York Hospital simply recommends that when the terms tea- or tablespoonful are used, they be considered as representing approximately the given equivalents, this new, eighth decennial, revision of the U.S.P. directs that the given values for approximate measures *should* be used, despite the fact that they are not in keeping with the actual capacity of the spoons mentioned. So far as the metric system of weights and measures is concerned, the revision committee appear to have lost sight of the fact that metric quantities are decimal in nature and are most readily multiplied by 5 or 10, or multiples of these figures.

Altogether it may be said that the figures that are given in the

new pharmacopœia as representing doses of official articles in metric quantities, bear such a startling resemblance to the corresponding fips, bits, levies and shillings that were formerly used in connection with our decimal system of coinage, that the question inadvertently suggests itself, Can it be that the members of the revision committee, are Rip Van Winkle-like, the reawakened greatnesses of bygone generations?

Changes in Titles.—For many decades it appears to have been the ambition of successive revision committees to establish a record for the number of changes in titles. The Pharmacopœia for 1880 contains a list of 256 changes, and this number was readily exceeded by the revision committee for 1890 with a total of 281 changes. The latter comparatively high number is again exceeded by the present committee, who present us with a list of no less than 297 changes in titles. Of this number 142 are changes in the official Latin and 155 changes in the official English titles of the Pharmacopœia. Many of the changes that have been made are quite in keeping with the instructions that were given the committee by the National Convention. Some of the changes, however, and of these there are not a few, fully illustrate the truism quoted by the president, Dr. Horatio C. Wood, in his address before the National Convention, that: "In this, as in former ages, men are creating confusion by creating names."

The production of such lexicographic monstrosities as "Fluidextractum" and "Fluidextract" should require a more satisfactory explanation than the feeble apology that is offered in the preface of the Pharmacopœia, particularly in view of the fact that the instructions given by the national convention of 1900 distinctly "recommend that changes in the titles at present official be made only for the purpose of insuring greater accuracy or safety in dispensing."

For upwards of half a century it has been customary to abbreviate the titles for this class of preparations by F. E., Fld. Ext., or Ext. (Latin title) Fld. Any one and all of these abbreviations would be manifestly incorrect in connection with the new, official, compounded titles.

In this connection it may be pointed out that the revision committee might have attained precisely the same results by adhering more closely to its instructions and incorporating general formulas or at least by dividing the extract preparations into two logical

classes headed "Extracta" and "Extracta Fluida" respectively. By doing so they could have readily obviated "the intermingling in the text of extracts and fluid extracts" that, as is stated in the preface to the Pharmacopœia, was the sole reason for this change.

By adopting a general descriptive heading for fluid extracts, the revision committee might also have divested the book of a large number of practically useless preparations with which it is at present encumbered.

Among other changes of doubtful utility is the introduction of "Spiritus Glycerilis Nitratis" in place of "Spiritus Glonoini." While the former is undoubtedly proper and perfectly correct from a chemical point of view, it is a stranger in a strange land, and is, like many of the other changes, not fully in harmony with the instructions that should have guided the committee.

Despite the comparatively large number of changes in nomenclature that have been made by the present committee, the members have not seen their way clear to adopt the recommendations of the American Association for the Advancement of Science, as to the spelling of chemical terms. This is rather unfortunate, as several, if not all of the leading medical journals of the country have adopted the more rational spelling for chemical terms, and it is not likely that they will readopt the antiquated superfluities retained by the present pharmacopœia.

In this connection the members of the revision committee would have done well to remember that anything that makes for simplicity makes for progress, and even if they were not prepared to drop the terminal e from the English names for alkaloids, there is practically no reason why the same termination should be retained in connection with such words as bromide, chloride, oxide, etc.

Assay Processes.—The Committee on Revision has given rather a liberal interpretation to the instruction given by the National Convention, "to append assay processes to as many of the potent drugs and preparations made therefrom as may be found possible, provided that the process of assay is reasonably simple (both as to methods and apparatus required) and leads to fairly uniform results in different hands."

In following out these instructions the committee has appended assay processes to at least twenty potent drugs and the preparations made from them. Assay processes have also been appended to

thirteen of the official essential oils. Whether or not all of these processes will fully meet with the qualifications provided in the committee's instructions time alone can demonstrate, as it will require a considerable number of experiments by widely differing operators to demonstrate whether or not the adopted processes "lead to fairly uniform results in different hands."

Purity and Strength of Pharmacopœial Articles.—To fully meet the recommendations of the National Convention, on the purity and strength of pharmacopœial articles, the Committee on Revision has adopted what it is pleased to designate as the "Purity Rubric." While considerable publicity has been given the fact that the adoption of such a standard, or rather series of standards, was contemplated, little or nothing has been known as to the proposed limitations of the permissible impurities, and the official descriptions of the included chemicals will, no doubt, be eagerly scanned by pharmacists and others to learn what, and how much, foreign material may officially be found in, or added to, any given substance.

In common with the assay processes mentioned above, time alone can demonstrate the wisdom, or the desirability, of making much of this particular innovation in the way it has been done. It is quite probable, however, that it would have been more satisfactory if the Committee on Revision had adopted generally attainable standards for purity without laying undue stress on the permissible impurities, or, as stated in the preface to the Pharmacopœia "more accurately defining the limit of purity permissible in official chemical substances."

Regarding the second portion of this item of the instructions, the committee has only partially acceded to that portion which reads:

"It is recommended that the committee keep in view the desirability of at least a gradual approach, upon mutual concessions, towards uniformity with similar preparations of other pharmacopœias, particularly in the case of potent remedies which are in general use among civilized nations."

By comparing the formulas for preparations of potent drugs with the provisions of the protocol signed by the accredited representatives of civilized nations, at Brussels, in 1902 (A. J. P., 1903, page 1), it will be found that our U.S.P. preparations still differ in many particulars from the proposed International Standard.

The committee, it is true, has made a number of important con-

cessions, but there is no reason why the United States of America, as the leading nation of the civilized world, should re use to fully accept provisions that are so evidently in harmony with progress and science as are those adopted by the International Conference for the unification of the formulas of potent medicaments.

Changes in Strength.—The comparative table showing the strength of the more important pharmacopœial substances and preparations in the preceding and in the present Pharmacopœia includes a total of 106 titles. While it is true that many of the changes that have been made are unimportant, and while practically all of them are in the direction of greater uniformity, and therefore to be commended, there are several for which the necessity of the change is not apparent. Why should the strength of chrysarobin ointment be changed from 5 to 6 per cent., or why should the ointment of phenol be changed from 5 to 3 per cent.?

On the other hand, some of the changes that have been made are not quite radical enough. Why, for instance, if any change was thought necessary in the morphine content of opium and its preparations, did the committee not see its way clear to adopt the proposed International Standard for powdered opium, 10 per cent., in place of reducing the maximum content to 12·5 per cent. from 15 per cent., the maximum of the Pharmacopœia for 1890?

The changes that have been made in the strength of a number of frequently used, and, therefore, comparatively important, galenical preparations are of such a nature that they should have been given wide publicity before the book was published, particularly in view of the fact that so short a period was to intervene between the date of publication and the date when the book was to become the accepted official standard. In view of the importance of these changes it may be well to call special attention to a number of them and they have, for this purpose, been incorporated in the appended table:

TABLE NO. 2.—SHOWING SOME OF THE MORE IMPORTANT CHANGES IN THE STRENGTH OF GALENICAL PREPARATIONS.

English Title.	Pharm. 1890. Per Cent.	Pharm. 1900. Per Cent.
Solution of Ferric Chloride	37·8	29
" " " Sulphate	28·7	36
" " Iron and Ammonium Acetate,	2·	4·
Opium, granulated	13–15	12–12·5
" powdered	13–15	12–12·5

Syrup of Ferrous Iodide	10	5	
Tincture of Aconite	35	10	
" " Belladonna Leaves	15	10	
" " Cantharides	5	10	
" " Capsicum	5	10	
" " Colchicum Seed	15	10	
" " Digitalis	15	10	
" " Gelsemium	15	10	
" " Hyoscyamus	15	10	
" " Indian Cannabis	15	10	
" " Lobelia	20	10	
" " Nux Vomica	0·3	total alkaloids 0·1	strychnine
" " Opium	1·3– 1·5	1·20– 1·25	
" " " deodorized	1·3– 1·5	1·20– 1·25	
" " Physostigma	15	10	
" " Rhubarb	10	20	
" " Sanguinaria	15	10	
" " Squill	15	10	
" " Stramonium	15	10	
" " Strophanthus	5	10	
" " Veratrum	40	10	

In connection with the changes made in the strength of the tinctures of potent drugs an explanatory note, similar to that included with tincture of aconite, tincture of strophanthus and tincture of veratrum, should also have been appended to tincture of capsicum and tincture of cantharides, the latter particularly, as it is now the most potent of all the official tinctures.

The addition of 2 per cent. of diluted hypophosphorous acid, to the syrup of ferrous iodide, is an unnecessary precaution and is particularly unfortunate in view of the fact that it introduces into this formula an additional ingredient not provided for in the provisions accepted by the International Conference at Brussels.

Additions and Dismissals.—The additions and dismissals, in connection with the publication of a new Pharmacopœia, may be variably regarded as an index of the care and scrutiny that has been exercised by the Committee of Revision in correctly interpreting the popularity, or lack of popularity, of the several substances that are brought before it for consideration; or, they may be regarded as an indication of the number of comparatively useless articles that are still included in the book itself.

Figures, while they offer but an uncertain basis for comparison, are usually interesting and it may therefore be permissible to in-

clude a comparative table showing the number of admissions and dismissals enumerated in the three recent editions of the U.S.P.

TABLE NO. 3.—SHOWING THE NUMBER OF ADDITIONS AND DISMISSALS IN THE EDITIONS OF THE U.S.P. FOR 1880, 1890 AND 1900.

	1880.	1890.	1900.
Additions	256	88	121
Dismissals	229	92	155
Total	485	180	276

That the members of the revision committees for 1880 and 1890 were more than usually careful in the consideration of their dismissals is evidenced by the fact that the present list of additions contains but three articles that were dismissed from these former editions. Of these articles, but one, extractum malti, dismissed from the Pharmacopœia for 1890, may properly be considered a desirable addition to the official materia medica. The other two, berberis and ceratum resinæ compositum, may safely be classed as being of doubtful utility. The latter particularly, popularly known as Deshler's Salve, while it has some local reputation in Philadelphia and its immediate vicinity as a household remedy, will find little or no use in the everyday practice of the modern surgeon.

Even a cursory review of the lists published in the new Pharmacopœia will suggest to the ordinary observer that the present Revision Committee has also been rather more careful with its dismissals than with its new additions, fully 30 per cent. of the latter being articles that are more or less limited in their uses. As an illustration of the rather liberal policy pursued by the committee it will suffice to call attention to the list of fluid extracts that are newly admitted; of the thirteen preparations included under this head it is safe to say that the fluid extract of cascara sagrada aromatic is practically the only one for which there was any real need, and here it is doubtful indeed if the committee has selected a formula that will give uniformly good results, or whether the preparations made according to this formula will be at all comparable to similar preparations put out by manufacturing pharmacists. Of the dismissals probably not more than three, or at most four, will be seriously missed. Potassa sulphurata might have been retained as it is not infrequently prescribed by dermatologists, in lotions, and being a substance that is not particu-

larly stable, some official limitation of the permissible decomposition would appear to be particularly desirable. Sodii carbonas is another substance for which there would appear to be little or no valid reasons for its dismissal; it is true the committee has offered us, as a substitute, sodii carbonas monohydras, but as this substitute appears to be quite unknown in the ordinary channels of trade, not even appearing in the price lists of manufacturing chemists, it would seem as though the committee might have contented itself by replacing sodii carbonas exsiccatus by the new title and retaining the well-known, though admittedly variable, sodii carbonas until such times as sodii carbonas monohydras had demonstrated its supposedly superior qualities.

At least one of the dismissals has considerable sentimental interest. For more than sixty years absinthium has practically served as the first stepping stone of the average apprentice into the interesting and fertile fields of pharmaceutical learning. In this connection it would be interesting, indeed, to know what a host of pleasant and in some cases, perhaps, unpleasant memories will be awakened by the dismissal of this one article. To many of the older men particularly it will appear as though another of the threads that binds the present with the past has been broken, and the question suggests itself, who is there that is willing and able to record the history, the romance and the varied memories that necessarily cluster about this singularly interesting though admittedly useless drug?

General Formulæ.—Paragraph 6 of the general principles to be followed in revising the Pharmacopœia, has already been referred to in another portion of this review. Unfortunately, perhaps, for the present-day pharmacist the instructions that were given the committee were not sufficiently specific, and the members of the committee probably thought it beyond their province to include general formulæ for preparations not included directly in the Pharmacopœia.

Some of the formulæ for galenical preparations that are included in this new Pharmacopœia would appear to indicate that the members of the Committee on Revision have lost faith in the ability, cunning and training of the average American pharmacist.

For more than half a century it has been the belief of the American pharmacist that he could, and actually did, make a very large number of extractive preparations by percolation that, in other countries, were usually made by maceration. The present revision

committee, recognizing the fallacy of this belief, have directed that a number of tinctures, formerly made by percolation, be now made by the older, more uncertain and less economical method of maceration and subsequent filtration. The Committee on Revision has gone even farther than this in connection with the official wines, and directs that four of the five wines of vegetable drugs be made from "fluidextracts," simple dilutions.

These are subjects, however, that should be, and probably will be considered at greater length at some future time, and are, in addition, not quite germane to the subject under consideration.

Suppositories.—Under this heading the revision committee gives a lengthy and in many respects excellent dissertation on the various kinds of suppositories in use, and the different materials used in their manufacture. In some particulars, however, the description is not quite in keeping with the facts.

When the committee asserts that suppositories "melt readily at blood heat," the assertion should have been qualified and made to apply only to that class of suppositories that do, or are intended to, melt at about that approximate temperature. Glycerin suppositories, for instance, do not and are not intended to melt at a low temperature.

In describing the method of making suppositories the committee speaks of fusion and of rolling by hand. As a matter of fact, by far the greater number of suppositories made and used in this country are made by cold compression in machines making from 1 to 300 suppositories at a time. As this process is not mentioned in this official description, it is fair to suppose that suppositories of this kind do not meet with the requirements of the Pharmacopœia, and should not be dispensed or used unless specified. The official weight of rectal suppositories, formerly 1 gramme, has been changed to 2 grammes, and the weight of glycerin suppositories is now a fraction more than 3 grammes, or little more than one-half the size of those formerly official.

Of the several preparations for which a general formula might very properly have been added to this pharmacopœia, the most popular are hypodermatic tablets. These preparations are now so extensively used, and the diluting powder used by different makers varies so greatly, that some restriction or at least suggestion as to the more desirable diluent, size and methods of making might well

have been included as a guide and for general information to physicians and pharmacists.

Powdered Drugs.—The motion, adopted on the second day of the Pharmacopœial Convention, "That the Committee on Revision be requested to consider the advisability of treating the subject of powdered drugs in the text of the Pharmacopœia," has received but indifferent attention, so that in this one particular at least, the present edition of the U.S.P. is decidedly behind the latest edition of the German Pharmacopœia, published more than five years ago.

This action is the more unfortunate as the practice of supplying ground and powdered drugs probably originated and is certainly more generally followed in this than in any other country in the world.

Standard Dropper.—Another motion, also considered on the second day of the Convention, recommending the adoption of a standard medicine dropper, was referred to the Committee on Revision without recommendations. In view of the fact that the International Conference for the Unification of Potent Medicaments adopted practically the same description for a dropper, and the same approximate equivalent for the size and weight of a drop of water, it does appear more than passing strange that the members of the Committee on Revision should have ignored the subject entirely.

Atomic Weights.—The decision of the committee to adopt the so-called didactic standard of atomic weights (H = 1) in place of the international or practical (O = 16) is to be deplored, particularly from the point of view of the pharmacist or the practical chemist, who can have little or no interest in the abstract principles involved in teaching the theory of chemical philosophy.

The practical reasons for adopting oxygen = 16 as the basis of the atomic weights in a work of this kind have been recounted in this JOURNAL so recently (AMER. JOUR. PHARM., 1902, pp. 153, 231) that there is but little necessity for going over this ground again.

A pharmacopœia is, or rather should be, above all a practical book for every-day work, and any feature that will in any way contribute to facilitate the necessary calculations connected with the estimation of the amount of a certain elementary body in any given combination, should be accepted without question. In addition to this, chemists who are actively engaged in industrial or analytical work the world over are using O = 16 as the basis of their calculations

The same is true of the pharmacopœias that have recently been published or are being prepared in Europe.

How much more closely the molecular weights of official substances, if based on an atomic weight of O = 16, would correspond to the molecular weights of the same substances as given in the pharmacopœias of 1880 and of 1890, is well shown by the appended table:

	U.S.P. 1880. H = 1 + O = 16.	1890. H = 1.	1900. H = 1.	G. P. 1900. O = 16.
Water	18	17·96	17·88	18·02
Sugar	342	341·2	339·6	342·22
Morphine sulphate	758	756·38	752·83	758·54
Quinine sulphate	872	870·22	866·15	872·78
Strychnine sulphate	856	854·24	850 21	856.78
Salicin	286	285·33	283·99	286·18
Silver nitrate	169·7	169·55	168·69	169·97
Sodium phosphate	358	357·32	355·61	358·35
Zinc sulphate	286·9	286·64	285·41	287·6

Specific Gravity and Solubility.—The adoption of 25° C. (77° F.) as the standard temperature at which the specific gravity as well as the solubility of the several chemical substances are to be determined and compared will undoubtedly meet with general approval, and is quite in keeping with a number of other practical advances that have been made in the chemistry of the new U.S.P.

This degree of temperature is so nearly the average of that maintained in habitations in temperate climates, that there should be little or no difficulty to obtain and maintain it, even with the limited amount of apparatus usually found in the average pharmacy. The adoption and use of this readily obtained degree of temperature should do much towards inducing pharmacists to apply many of the prescribed tests for the different official drugs and preparations, and thus make them familiar with the importance of specific gravity and solubility as an indication of the identity, purity and strength of many of the official substances.

Appendix.—This portion of the book can hardly be said to have been subjected to any radical changes, the bulk of the contained material and the manner of arranging the same being practically the same as that of the Pharmacopœia for 1890. A special table of contents has been added, and the whole section appears to have been carefully revised so as to bring it fully in harmony with the ad-

mittedly highly scientific character of the chemical portions of the new pharmacopœia.

A number of new reagents, test solutions and volumetric solutions have been added, and several of the more obsolete or less useful tests have been omitted. Numerically, the present Pharmacopœia has sixteen more tests and reagents and four more volumetric solutions than were included in the Pharmacopœia for 1890, which contained a total of 135.

Among the innovations in this portion of the book is a time-limit test for heavy metals. "To detect the presence of poisonous or undesirable metallic impurities in official chemical substances or their solutions." The test is designed to detect objectionable quantities of antimony, arsenic, cadmium, copper, iron, lead and zinc, and is referred to repeatedly in the text of the Pharmacopœia as an indication of the permissible limitations of these substances.

The appended tables have been carefully revised, so as to bring them up to date and fully in harmony with the changes that have been made in the text-book itself. One additional table, a table of weight and volume relations, has been added.

The index, which is also considered as a portion of this appendix, consists of forty-four double-column pages, and contains upwards of 3,500 references. The popular synonyms that appeared as an integral part of the description of the several official articles in previous editions of the Pharmacopœia, have been relegated to the index, where they appear as cross references, being printed in small type under the official Latin titles, and in the ordinary type in their alphabetical order, followed by the official Latin title.

The Problems Before Us.—For the final publication of the new Pharmacopœia, and for all material advances that have been made in connection with it, we are indebted to the members of the Committee on Revision. They, individually and collectively, have devoted to the work a considerable amount of time, thought and labor for which they will not, and, in fact, could not, be adequately recompensed by any profits that can possibly accrue from the use or sale of the book.

That the eighth revision of the Pharmacopœia of the United States of America will be the most popular and most widely used of all the editions of the book so far published, is to be expected, and is in a measure assured by the increasing sale, use and popularity of the U.S.P. in recent decades.

The recognition that the present edition of the U.S.P. will receive, and the influence that it will have among medical practitioners, will depend largely on how the pharmacists of the country demonstrate their ability to interpret the descriptions, the formulas and the directions that are embodied in it.

That the time that has elapsed between the meeting of the National Convention in 1900, and the final publication of the Pharmacopœia in 1905, has been so long, is unfortunate, and is probably due to a series of unforeseen circumstances that could not have been properly provided for by the National Convention itself. For the apparent undue haste, however, with which the present Pharmacopœia is expected to be put into use, as the official authority, after its final publication, the National Convention must share the responsibility and the blame with the members of the Board of Trustees. It is true that the National Convention resolved that the date when the new Pharmacopœia is intended to go into effect should be reasonably distant from the actual date of publication, but the wording of this resolution was so indefinite, that, in view of the long period of time that has elapsed since the present revision of the Pharmacopœia was commenced, the members of the Board of Trustees should not be too severely criticized for appearing to be overanxious to get this, their first venture in the publication line, before the medical and pharmaceutical professions.

A repetition of this rather unfortunate combination of circumstances might, and properly should, be guarded against at the next decennial meeting of the United States Pharmacopœial Convention, in 1910, by outlining more clearly the general principles to be followed in revising the Pharmacopœia and by fixing on a definite date, at least four or six months after the actual publication of the book, when the same shall become authoritative and official.

The time that is usually required to prepare the revision of the Pharmacopœia for the press could, and certainly should, be materially reduced if pharmacists, and others who are interested, would liberally criticise the book before the meeting of the National Convention so as to allow the Committee on Revision and the representatives of accredited societies to present definite and acceptable outlines for revising not alone the general principles that are involved but also such of the official formulas and descriptions as may be found faulty or incorrect.

The scope of the Pharmacopœia could very well be still more restricted and be made to include only such drugs and preparations as are generally used in different sections of the country. In addition to this general formulas, or descriptions of classes of preparations, should be introduced and be made to provide for a host of preparations not necessarily carried as an integral part of the Pharmacopœia itself.

For that large, and constantly growing, class of substances that goes to make up the universal, or common, stock of medicines we should have a due and proper consideration for the usages in other countries and endeavor to adjust our descriptions in such a way that they will coincide as much as possible with similar descriptions in other National Pharmacopœias.

This principle, a due regard for the uses and practices in other countries, is known to have been recognized by the National Convention that met in Washington, in 1850, and is commented on favorably in the preface to the Pharmacopœia for that year.

Since then, however, man, through his knowledge and application of the practical sciences, has been able to annihilate time and space to such an extent that important happenings in distant parts of the world may, in point of time, be announced to us before they occur.

The progress that has been made in this direction has had a very marked influence in eliminating local, and even national, ideas and customs, and has practically done away with the clannishness and conservatism that formerly distinguished and effectually segregated the different nations of Europe. This same spirit of progressiveness has also had a marked effect on the science of medicine; and the practice of pharmacy, particulary, has undergone changes but little dreamed of half a century ago.

So far, neither these changes themselves, nor the spirit of progressiveness that has brought them about, are as fully or as truthfully reflected in our National Pharmacopœia as they should be, and it remains for us to say whether or not they are to be more clearly portrayed in the next revision.

In this connection it must be remembered that the pharmacists of this country, individually and collectively, are responsible for the shortcomings, errors, ambiguities and faults of the Pharmacopœia unless they are in a position to point out to the present and to the succeeding Committee on Revision why and how corrections are to

be made, and where and how the book itself may be improved so as to make it, as it rightfully should be, the accepted and acknowledged authority on all matters pertaining to drugs and preparations that are generally accepted and widely used in the treatment of disease.

ALKALOIDAL ESTIMATIONS IN THE UNITED STATES PHARMACOPŒIA, EIGHTH REVISION.

By W. A. Puckner.

The United States Pharmacopœia of 1890 prescribed standards for three alkaloid bearing drugs, cinchona, nux vomica and opium, and for six preparations therefrom, namely, extract, fluid extract and tincture of nux vomica, and extract, tincture and deodorized tincture of opium. The eighth decennial revision of the United States Pharmacopœia directs alkaloidal estimations for twenty-one drugs: aconite, belladonna leaves, belladonna root, cinchona, red cinchona, coca, colchicum seed, conium, guarana, hydrastis, hyoscyamus, ipecac, nux vomica, opium, deodorized opium, granulated opium, physostigma, pilocarpus, scopola and stramonium. Further, the estimation of alkaloid in thirty-four preparations of these drugs is directed; namely, belladonna plaster, extracts of belladonna leaves, colchicum corm, hyoscyamus, nux vomica, opium, physostigma, scopola and stramonium, fluid extracts of aconite, belladonna root, cinchona, coca, colchicum seed, conium, guarana, hydrastis, hyoscyamus, nux vomica, opium, deodorized opium, physostigma and stramonium. Truly, a victory for the advocates of alkaloidal assays! The advanced position which the revision committee has taken in respect to standardization of alkaloidal drugs and their preparations is shown by a glance at the German Pharmacopœia, which went into effect January 1, 1901, and the British Pharmacopœia of 1898. The latter directs the valuation of the preparations of belladonna, cinchona, ipecac, nux vomica and opium only, twelve altogether. It requires but two drugs, red cinchona bark and opium, to be assayed; evidently considering such assays superfluous when the preparations of the drugs, the form in which they are administered, must be assayed when finished. The German Pharmacopœia prescribes methods of valuation for six drugs, aconite, cinchona, ipecac, nux vomica, opium and pomegranate, and for the prepara-

tions of belladonna, cinchona, hydrastis, hyoscyamus, nux vomica and opium—ten altogether.

The advanced position taken by the revisors of the Pharmacopœia is also shown by the nature of the standards adopted. While our Pharmacopœia of 1890 and the present German Pharmacopœia direct the determination of total alkaloids of nux vomica, the new revision of the Pharmacopœia, also the British Pharmacopœia, separates brucine from strychnine and estimates the strychnine only. When assaying opium the purity of the precipitated morphine must be proven. While the British Pharmacopœia directs the estimation of total alkaloids in ipecac the new book uses a method which rejects the inert psychotrine. Similarly an attempt is made to estimate, not total alkaloids, but cocaine in coca.

As is well known, the amount of alkaloid in a given drug is subject to wide variations, depending on the conditions under which it was grown, when collected, etc., and the means to be adopted to obtain a drug preparation of definite strength has been a frequent subject of discussion. It is often asked whether, to obtain a fluid extract of a certain alkaloidal content, must a drug of such strength be used so that 100 grammes will yield 100 c.c. of a fluid extract of the correct strength? Or may weak and strong drug be mixed in such proportions that 100 grammes of the mixture will yield 100 c.c. of a fluid extract of the correct strength? Or may drug of any strength be used and the volume of the finished fluid extract adjusted accordingly? Similarly, in the preparation of solid extracts it is asked whether an extract above the desired strength may be reduced with a weaker extract? Or may inert matter be used as diluent? And, if so, what diluent shall be used? Or if extract of nux vomica should be deficient in alkaloid, may perhaps it be fortified with strychnine? Generally, the U.S.P., eighth edition, requires drugs, when assayed by the process given, shall yield "not less than" a given per cent. of alkaloid, and the preparation obtained therefrom shall, if "found by the assay to contain more than" the required percentage of alkaloid, be diluted to a definite strength. For fluid extracts menstruum such as was used for the percolation is usually directed as the diluent, and for extracts, dry as well as those of pilular consistence, sugar of milk is directed. Generally, as stated before, the preparations of drugs are directed to be adjusted to a definite standard; thus extract of nux vomica must contain 0.5

per cent. strychnine, extract of opium 20 per cent. of morphine, fluid extract of nux vomica 1 gramme strychnine in 100 c.c. An exception is tincture of opium, which "should contain in 100 c.c. not less than 1·2 nor more than 1·25 grammes" of morphine. For tinctures no directions for diluting to a definite standard are given, they being required to contain "not less than" a stated amount of alkaloid; exceptions to this are tinctures of aconite and belladonna leaves, which are to be adjusted to a definite standard. No authority is given for concentrating preparations if they, on assay, are found below standard, and, since a minimum standard is prescribed for the crude drug, this condition need perhaps not arise. But if coca leaves assaying 0·4 per cent. are on hand, what disposition is to be made of them? If mixed with an equal bulk of leaves assaying 0·6 per cent., may this mixture be considered to be coca U.S.P.? Since with opium the mixing of weaker and stronger drug in proper proportions is specifically directed, and since no such directions are given for any other drug, does this mean that this procedure may be used with opium only?

As was natural, the Keller method of assay, with few exceptions, was adopted for the assay of crude drugs. For belladonna leaves, belladonna root, coca, hyoscyamus, scopola and stramonium, the writer's modification of the Keller method (*Pharm. Rev.*, 1898, 16, p. 180), which avoids the use of aliquot parts, was adopted. For aconite the method of A. B. Stevens (*Pharm. Arch.*, 1902, 6, p. 49; Proc. A. Ph. A., 51, 776), in which the drug is extracted with 70 per cent. alcohol, was adopted. For pilocarpus the method of A. B. Lyons (Proc. A. Ph. A., 1903, 51, p. 254), in which the drug is percolated with chloroform in the presence of ammonia and where also aliquot parts are avoided, is given.

For fluid extracts quite a variety of methods were adopted. Fluid extract of aconite is, of course, assayed by the Stevens method. Fluid extracts of belladonna leaves, hyoscyamus, scopola and stramonium are to be assayed by the method suggested by the writer (*Pharm. Rev.*, 1898, 16, p. 303), in which the fluid extract is diluted with water, made alkaline with ammonia water and extracted with chloroform without having previously expelled the alcohol contained in the fluid extract. When assaying fluid extract of coca the same method is used, except that ether is substituted for chloroform. Fluid extracts of ipecac and nux vomica are illustrations where the

alcohol is expelled before the liquid is transferred to the separator for extraction. In fluid extract of colchicum seed and fluid extract conium the liquid is evaporated to dryness with sand, and then the Keller assay method applied. While in the assay of hydrastis the insolubility of berberine in ether is depended on to separate hydrastine from berberine, when the fluid extract is assayed the berberine is precipitated and removed as the iodide, as recommended by Gordin and Prescott (AM. J. PHARM., 1899, 71, p. 257).

The methods for the assay of tinctures and extracts are generally adapted from those prescribed for the corresponding fluid extracts. Thus extract of belladonna leaves is dissolved in a mixture of water, alcohol and ammonia water, and then treated as directed for the fluid extract, while extract of physostigma is digested with a little dilute alcohol, then brought to dryness with sand and assayed.

When the alkaloidal residue obtained in the assay is to be titrated, generally hematoxylin is to be used as indicator, even when titrating ipecac alkaloids. In some cases iodeosin is given as an alternate; in nux vomica it is specified.

Caffeine, colchicine, hydrastine and morphine are determined by weighing the free base, the purity of morphine being checked by its solubility in lime water. Conine is weighed as conine chloride.

When stramonium leaves or its preparations are submitted to assay the alkaloidal content is calculated from the amount of acid required for the neutralization of the extracted alkaloids; but this assay tells practically nothing about the identity of the alkaloids. As far as the assay is concerned, fluid extract of coca might be substituted for stramonium leaves or a worthless lot of hyoscyamus might be brought up to standard by the admixture of very little belladonna leaves. While such substitution has been detected in commercial products, as, for instance, in sheep dips, sold on their nicotine content, which have been found adulterated with pyridine (J. A. Emery, *J. Am. Chem. Soc.*, 1904, **26**, p. 1113), no similar adulteration has to my knowledge been reported for medicinal substances. Although not requiring an identification as well as an estimation of the alkaloid of drugs, as does the German Pharmacopœia, in some cases the U.S.P. standards in a way do define the identity of the alkaloids; thus hydrastis is required to contain not less than 2·5 per cent. of *hydrastine*, belladonna leaves shall yield not less than 0·35 per cent. of *mydriatic* alkaloids, fluid extract of

belladonna root must contain 0·5 grammes of *mydriatic* alkaloids *from belladonna root*, and fluid extract of guarana must contain in 100 c.c. 3·5 grammes of the *alkaloids from guarana*.

Finally, the retention of H=1 standard of atomic weights should here be noted, since it is liable to be of some annoyance in alkaloidal estimations. Thus, while with this standard the molecular weight of aconitine, $C_{34}H_{47}O_{11}N$, is 640·55, it is 645·42 when the now generally adopted standard, O = 16, is used to calculate the molecular weight, and an inadvertent substitution of one for the other may introduce an error of nearly 1 per cent. in a volumetric estimation of aconitine.

SCIENTIFIC DEPARTMENT,
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PROFESSOR HORATIO C. WOOD.

BY HENRY BEATES, JR.

Prof. Horatio C. Wood, the President of the U. S. Pharmacopœial Convention, is a physician of distinguished and scientific merit, as well as a naturalist of world-wide fame. He was born in Philadelphia, Pa., January 13, 1841. He is a descendant of Richard Wood, who emigrated from Bristol, England, in 1682, and settled first in Philadelphia, and later in New Jersey. His genealogy on his father's side in America, arranged in generations, is Richard Wood, James Wood and Jane Wood, Richard Wood and Priscilla Bacon Wood, Richard Wood and Hannah Davis Wood, Richard Wood and Elizabeth Bacon Wood, Horatio Curtis Wood and Elizabeth Bacon Wood.

On the mother's side he is believed to be descended from Samuel Bacon, who, in 1685, purchased lands on the Cohansey River, Cumberland County, N. J., from the Indian sachems. Samuel Bacon is the reputed son of Nathaniel Bacon, who was a member of the Long Parliament, and banished under Charles II. This Nathaniel Bacon was the son of Sir Nathaniel Bacon, a brother of Sir Thomas Bacon and grandson of Sir Nicholas Bacon, Lord Keeper to Queen Elizabeth. Through Hannah Davis the strain of blood is traceable to a brother of Robert Bruce, of Scotland.

Professor Wood was educated at Westtown Boarding School, and the Friends' Select School of Philadelphia, both sectarian insti-

tutions, and graduated by the Medical Department of the University of Pennsylvania in the class of 1862.

Before entering medicine his fondness for natural history found him a worker in the Academy of Natural Sciences of Philadelphia. He there distinguished himself by his original work. His first original paper, "Contributions to the Carboniferous Flora of the United States," appeared in the proceedings of the Academy when he was but nineteen years old.

After obtaining the doctorate, he at once became a resident physician of the Philadelphia Hospital, and, a year later, occupied a similar post in the Pennsylvania Hospital.

He entered upon private practice in 1865, and directed his energies especially to materia medica and the art of therapeutics. During these years he continued his studies in natural history and published numerous valuable papers. His work in "cell botany" was noted, and of his many important papers one on the "Fresh-Water Algæ of North America" was published in the "Smithsonian" of 1872, with nineteen colored and two uncolored plates, and 360 original microscopical drawings. Thirteen original memoirs on entomological subjects contribute to his fame.

After 1873 he devoted his talents entirely to medicine. He occupied the Chair of Botany on the Auxiliary Faculty of Medicine of the University of Pennsylvania in 1866. He filled this chair, which had been established and endowed by his famous uncle, Prof. Geo. B. Wood, for ten years with distinguished merit. He devoted several years to the especial study of diseases of the nervous system, and was made clinical lecturer on this subject when, in 1894, the new University Hospital was organized.

The following year he was appointed Professor of Diseases of the Nervous System. As editor of *New Remedies*, 1871–73, and of the Philadelphia *Medical Times*, 1873–83; of the *Therapeutic Gazette*, 1884–90; and as sole editor of the latter half of the fourteenth edition of the United States Dispensatory, he served medical journalism with meritorious success. His co-operation in the revision of the fifteenth to eighteenth editions of the United States Dispensatory, with Profs. Joseph P. Remington and Samuel P. Sadtler, is well known.

His "Investigation of Thermic Fever or Sunstroke," 1892; "Studies n the Physiology of Fever"; his world-wide-used text and reference

book on "Materia Medica, Theapeutics and Toxicology," first edition, 1874; twelfth, 1905—are monuments to his learning and skill, and have served as most potent factors in evolving that type of modern thought so well termed rational medicine. Indeed, his influence for rational medicine classifies him as a pioneer.

His prize essay on "Thermic Fever or Sunstroke," in 1872; the brochure on "Brain Work and Overwork," in 1880; his text-book on "Nervous Diseases and Their Diagnosis," 1887; "Syphilis of the Nervous System," 1889; "The Practice of Medicine," in connection with Prof. R. H. Fitz, of Harvard, in 1896, compose the more widely used of his published works.

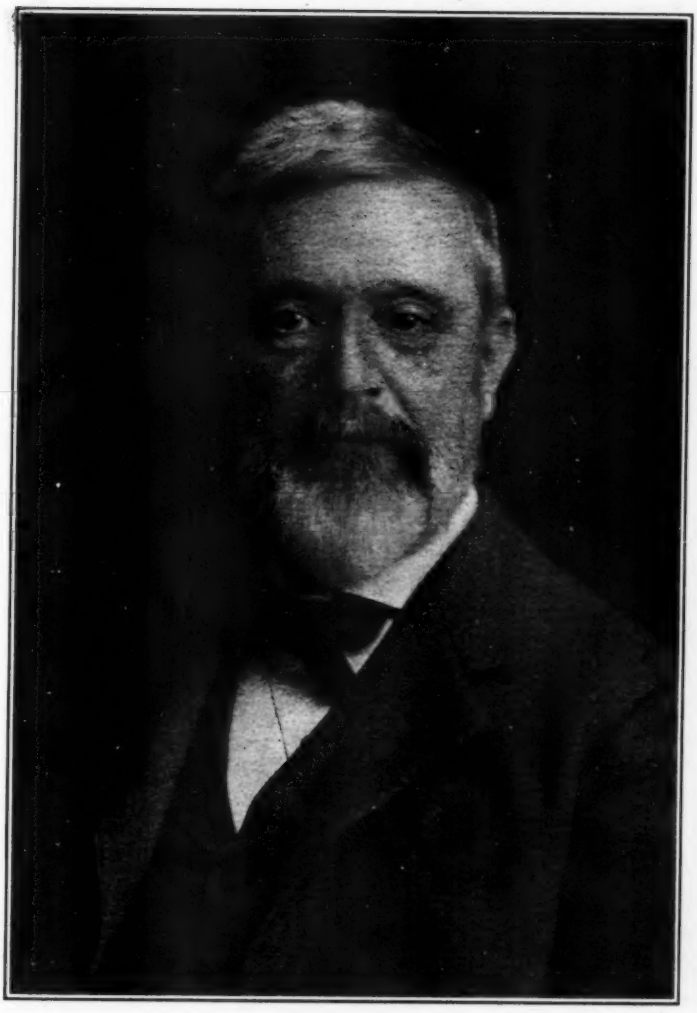
Miscellaneous papers have been published by the Smithsonian Institute, the American Philosophical Society, the Academy of Natural Sciences of Philadelphia, Essex Institute of Salem, Mass., as well as by the various leading technical, scientific and medical journals of America, England and Germany. These comprise twenty-six original botanical and entomological papers and 240 original articles on experimental pathology, physiology, therapeutics and clinical and legal medicine.

Under the auspices of the Medical Alumni of Harvard University he delivered a special course of lectures on Therapeutics in that institution in 1893. In 1890 he was honored with delivering the address for America before the International Medical Congress in Berlin, Germany. He represented America again at the International Pharmacopœial Convention at Brussels, Belgium, in 1902.

He served his country during the War of the Rebellion as Acting Assistant Surgeon in Washington, Virginia and Philadelphia. As consulting neurologist he has been connected with the Philadelphia, Episcopal, University and Burn Brae Hospitals. He has won several prizes offered for scientific research, requiring ability of the highest order, and has been the recipient of honorary degrees by several of our most renowned institutions of learning.

Many scientific societies, including the National Academy of Science, are honored by his membership. The College of Physicians and Surgeons of Philadelphia in 1902 and 1903 accorded him their highest gift, the presidency.

This partial sketch of one of Philadelphia's most indefatigable and distinguished scientists would be incomplete were reference not had to his personality or character. Always exemplary of the highest



H. C. WOOD, M.D.,
President U. S. Pharmacopœial Convention, 1900.

ideals, he is thorough as an investigator, and demands of his students accuracy of work in the acquisition of knowledge. Exacting, he is ever courteous and considerate, and those who have profited from his teachings and enjoyed the privilege of his learned discourses hold in grateful remembrance him whom they respect and regard with high esteem.

His influence for strength of character; for unceasing endeavor to better and progress; for devotion to truth and the welfare of fellow man; for doing unto others as he would be done by; explain why the profession it has been his life-work to serve, has honored him with well-merited tributes of the highest confidences, trust and respect. Truly, of Wood it can be said, the world is the better for his having lived.

BIOGRAPHY OF PROF. JOSEPH P. REMINGTON.

By Chas. H. LaWall.

Equipped by nature with a rare combination of qualities of a high order, Prof. Joseph P. Remington, chairman of the Committee of Revision of the United States Pharmacopœia, is to-day unquestionably the foremost figure in American pharmacy. A profound student of human nature, a discriminating patron of art and literature, possessed of a wide fund of scientific knowledge and a man of rarely winning personality, he is the possessor of many other admirable qualities which endear him to his friends and compel the respect of those who differ from him.

Prof. Joseph P. Remington was born in Philadelphia on the 26th of March, 1847. His father was Dr. Isaac Remington, a well-known Philadelphia physician, and his mother was the daughter of John Hart, who was the descendant of Townsend Speakman, one of the earliest Philadelphia apothecaries. Professor Remington's ancestors on both sides of the family have been residents of Philadelphia for three generations, and all of them have been members of the Society of Friends.

From both his maternal and paternal ancestry Professor Remington inherited a liking for science, particularly in the direction of chemistry, and at an early age he equipped a small laboratory, where he carried out many experiments, and at this early period he constructed much of his own apparatus, being of a mechanical turn

of mind. At the age of fifteen he suffered the loss of his father, whose death at this time compelled him to change his plans regarding his education. There was no doubt as to the line of work for which he was best adapted, although many of his friends and relatives at that time wished him to take up his father's profession and become a physician. In this discussion he had his own way, and he was allowed to begin the study of pharmacy, his argument being that the best way to become a good physician was first to become a good pharmacist. He thus gained his point, and while medicine may have lost a shining light, pharmacy has acquired a new constellation, in which he is the central moving force.

On January 1, 1863, Joseph P. Remington began his apprenticeship whereby he was to learn the art and mystery of the apothecary business. The store selected was that of Charles Ellis, Son & Co., the selection being made by Mr. Henry M. Troth, the son of Henry Troth, who played such a prominent part in the early affairs of the Philadelphia College of Pharmacy. Mr. Troth was the brother-in-law of Professor Remington, and it was through him that Charles Ellis, the head of the firm, who was at that time the president of the Philadelphia College of Pharmacy, took more than ordinary interest in the young apprentice. In those days the apprenticeship to the drug business did not consist in selling postage stamps and serving soda-water, and the business of Charles Ellis, Son & Co. at that time embraced an unusually wide range of work, including the spreading of adhesive plasters and the manufacture of many pharmaceutical preparations on a large scale.

During his term of apprenticeship Prof. Remington attended the lectures at the Philadelphia College of Pharmacy, and the degree of Graduate in Pharmacy was conferred upon him at the Commencement of the College held in 1866. On January 1, 1867, Professor Remington entered the service of Dr. E. R. Squibb, who was probably the most painstaking and conscientious member of the pharmaceutical profession in this country. Professor Remington entered Dr. Squibb's family and made his home with them for nearly three years; during which time he acquired a practical knowledge of analytical and manufacturing work, which was rendered doubly valuable by the daily discussions with his preceptor, and the interest which Dr. Squibb took in his pupil. Professor Remington's special duties during the latter part of this period embraced the manufacture of chemical salts.

spirit of nitrous ether, oil of wine, purification of chloroform and the manufacture of ether for anæsthetic purposes, the latter process being one in which Dr. Squibb took especial pride, the product being made of the highest possible quality in an apparatus of his own devising.

The death of Professor Remington's mother at this period necessitated his return to Philadelphia, where he entered the employ of Powers & Weightman, with whom he continued until 1872, when he purchased the retail pharmacy at the northeast corner of Thirteenth and Walnut Streets. Here he continued in business for a period of thirteen years, during which time he showed himself to be equipped with practical business qualities seldom seen in combination with the high degree of professional knowledge of which he was the possessor.

His active participation in the affairs of the Philadelphia College of Pharmacy commenced in 1871, when he was invited to become the assistant to Prof. Edward Parrish, who then occupied the chair of Pharmacy in that institution. After the death of Professor Parrish, in 1872, Professor Procter, who was reinstated to the position of Professor of Pharmacy, which he had formerly occupied, retained Professor Remington as his assistant. These pleasant relations continued until the death of Professor Procter, in 1874, Professor Remington being elected in March of that year to the full Professorship in Pharmacy. His progressive spirit and his sincere love for his *Alma Mater* has led him to constantly exert his efforts toward increasing the equipment and raising the standard of education in the institution with which he has ever since been associated. It was through his instrumentality that the method of practical instruction in pharmacy was inaugurated and brought to its present high degree of efficiency.

Professor Remington's service in the American Pharmaceutical Association, of which body he became a member in 1868, has been varied and continuous. He has been the chairman of numerous important committees, among which may be mentioned the Committee on the Centennial Exhibition in 1876, at which time he played a very important part in local pharmaceutical affairs owing to his high professional standing, both as a teacher and as a practical pharmacist. In 1892 he was elected to the presidency of the American Pharmaceutical Association, and he presided over probably the

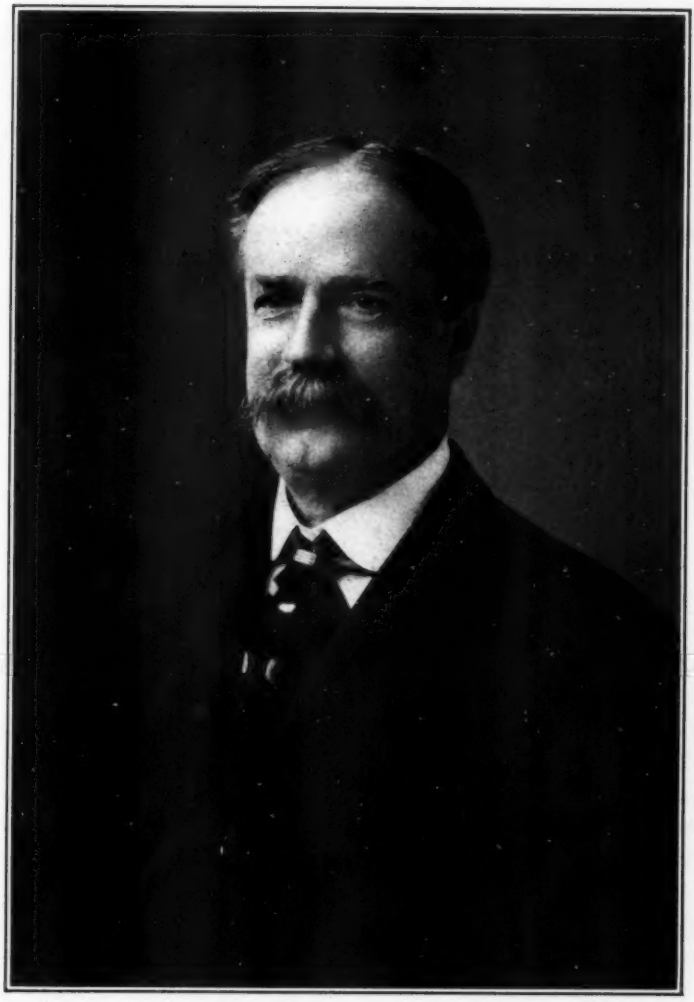
most important meeting in the history of that association—the one held in Chicago during the World's Fair in 1893, during which time there was also an important international pharmaceutical conference, over which he also presided. During his many years of membership in this association his numerous contributions of papers to the annual meetings have been valuable and interesting.

In 1878 Professor Remingtom aided in organizing the Pennsylvania Pharmaceutical Association. During the many years since that time Professor Remington has rarely missed a meeting of that association, as he has constantly been actively interested in all subjects pertaining to the advancement of pharmacy. He was elected to the presidency of the Pennsylvania State Association in 1896, and it was largely through his active efforts during President Hay's term of office in 1903 that the Pennsylvania Pharmaceutical Association added 500 new members by special organized effort of an auxiliary committee on membership of which Professor Remington was the chairman.

Professor Remington's high order of ability as a diplomat has frequently led to his appointment as a delegate to the various medical associations, and it is largely through his instrumentality that the most cordial relations have always existed between the organizations of these two great professions.

Professor Remington's contributions to the literature of pharmacy have not been confined to the writing of papers, but he is the author of one of the best-known text-books of pharmacy in the world, the "Practice of Pharmacy," first issued in 1885, and used at present in every college of pharmacy in America, besides being widely and favorably known abroad, and the fourth edition of which is now in preparation. He has also been an associate editor of the United States Dispensatory since 1879. During the period of his connection with that important work of reference, four editions have been issued, each of which has been successful in the highest degree. In 1897 he became the pharmaceutical editor of "Lippincott's Medical Dictionary," a standard work of reference.

From his prominence in association matters, Professor Remington has naturally been looked to for assistance in all matters pertaining to pharmaceutical legislation. That he has been a willing and able worker in this direction is attested by the fact that he was a prime mover in the efforts to have the college diplomas recognized by the



PROFESSOR JOSEPH P. REMINGTON,
Chairman U. S. Pharmacopœial Revision Committee, 1900.

various State authorities, and when the time became ripe for prerequisite legislation he was one of the hardest workers in securing the passage of the prerequisite amendment to the Pharmacy Law in the State of Pennsylvania in the Spring of 1905.

In 1886–7 Professor Remington was elected a Fellow of the Chemical, of the Linnean, and of the Royal Microscopical Societies of Great Britain. He has been a recipient of the honorary degree of Master in Pharmacy (Ph.M.) of the Philadelphia College of Pharmacy, and that of Doctor of Pharmacy (Phar.D.) from the Northwestern University of Chicago. He is an honorary member of the College of Pharmacy of the City of New York, and of the State Pharmaceutical Associations of New York, New Jersey, New Hampshire, Nebraska, Ohio, Colorado, Virginia, Georgia and others. He is a member of The American Philosophical Society, The American Chemical Society, The American Geographical Society, a life member of the Academy of Natural Sciences of Philadelphia, and of the Historical Society of Pennsylvania. He was appointed to represent the United States at the Eighth International Pharmaceutical Congress, held at Brussels in 1896; was a delegate to the Pan-American Medical Congress in 1893; also to the second Congress in Mexico in 1896. He holds honorable membership in the Pharmaceutical Society of Great Britain, the British Pharmaceutical Conference, Pharmaceutische Gesellschaft zu St. Petersburg, Instituto Medico Nacional, Mexico; Société de Pharmacie d'Anvers, Société Royale de Pharmacie de Bruxelles. He also holds membership in the Art Club, the Society of American Authors, the Franklin Inn Club, and the Church Club, all of Philadelphia.

Professor Remington's connection with the United States Pharmacopœia commenced in 1877, when he was appointed to serve on an auxiliary Committee of Revision appointed by the Philadelphia College of Pharmacy. The following year the same institution appointed him as a delegate to the National Convention for revising the Pharmacopœia, which body met in Washington, D. C., in 1880. The report of the committee from the Philadelphia College of Pharmacy was of such great value to the Revision Committee that he was elected a member of the final revising committee and chosen first vice-chairman of that body. In 1890 he was again sent as a delegate by the Philadelphia College of Pharmacy to the National Convention which met in Washington, and was again elected to the

position of first vice-chairman of the final Committee of Revision, and it was while serving in this capacity that the lamented death of Charles Rice, Chairman of the National Revision Committee, occurred on May 13, 1901. Although elected first vice-chairman for the purpose of succeeding to the chairmanship, Professor Remington felt that such an important position should not be filled by succession and, after serving a short time until the office was in running order, he asked for a special election to fill the position of chairman, for the enormous amount of time and labor which this position demands was not wholly at his disposal. Of the twenty-six members of the Committee of Revision, twenty-two voted for the election of Professor Remington, and he felt that, under the circumstances, it was his duty to accept.

The eighth decennial revision of the United States Pharmacopœia has been accomplished under great difficulties. An unusual number of deaths occurred in the committee. The chairman of the Committee of Revision and the chairman of the Board of Trustees of the Pharmacopœia, both died in office, and four other members passed away.

Professor Remington's summer months are spent at his seaside home in Longport, N. J., where much of the work of Pharmacopœial revision has been carried on under his immediate supervision and active participation. His judicious system of combining both business and pleasure in the proper proportions has enabled him to accomplish a wonderful amount of work without losing the buoyancy of manner and cheerfulness of disposition which have always been characteristic of him, and which have won him the friendship of all who have been fortunate enough to be associated with him. One of his most prominent characteristics, and the one to which his success may be largely attributed, is his wonderful painstaking attention to the minute details of whatever work occupies his attention for the moment. This is due to his remarkable power of concentration upon the subject at hand, which often enables him to do more than double the amount of work upon any subject than is done by the ordinary worker in a given time, and his insistence upon the same intensity of purpose in those who are associated with him in any undertaking, marks his ability as a leader of no ordinary calibre.

Professor Remington is a fluent and forceful speaker upon any subject pertaining to his professional work, and his ability as a

teacher is recognized by the thousands who have benefited by the instruction which he has so conscientiously given for nearly thirty-five years. Indeed he may be said to be a teacher of teachers, for most of the successul Professors of Pharmacy in America to-day have been pupils of his at some time during their careers.

As an extemporaneous speaker he has few equals in professional life, his ready fund of apt illustrations and his keen wit rendering him almost incomparable in this respect.

STRUCTURAL PLANT RELATIONSHIPS.[1]

By John Uri Lloyd, Ph.D., Ph.M.

Their Record.—Among the earliest remedial agents, as well as the most useful remedies of the present, are plant products and plant agents. From the dawn of the study of medicine to the threshold of the nineteenth century, the most conspicuous of all remedies have been those formulated under the influence of vegetable life. The simples of the aborigines of all climes and lands, the remedies of domestic medicine, as well as those of empiricism past and present, the agents that science most values and most studies, have been and yet are plant structures. Every country of the globe contributes thereto. Every people of the earth partakes thereof. The pharmacopœia of every country, the materia medica of all the schools in medicine past and present, give their best care to the remedial action of vegetable structures. These have ever been the established, the cherished remedies of all nations, and are no more to be displaced by artificial preparations from outside, than are vegetable foods to be replaced by synthetics evolved by the chemist.

Let us not neglect to credit the value of inorganics in life conservation. No man will deny the value of minute amounts of sodium and potassium compounds, of chlorine salts, of earths, of minerals in foods. Nor will he, if he thinks, undervalue the rational use of such in medicine, where either alone, or as integral parts of plant structures, they serve well their part. But as no reflecting man will presume to restrict his foods wholly to these unorganized substances, so no balanced mind, informed concerning the record of remedial

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[1] Read at the meeting of the National Eclectic Medical Association, St. Louis, 1904, and contributed by the author.

agents of the past, and their qualities at present, will deny the supremacy of vegetable *structures* as corrective agents in the hands of men qualified to use them intelligently.

The life of man and the health of man depend on the conservation of energy held in the life forces that are locked in vegetable structures, be they called food or remedy.[1]

Empiricism in Food and Remedy Studies.—As the natural foods of man are empirical (established by experimentation) so are the most useful plant remedies the result of empiricism. Lost in the past are the experiments that led man to know that wheat is a food, and the same is true of most fruits. The wanderings which give us our known foods and medicines are not less tortuous than the painful creeping of the human family from out savagery into civilization. But they are more obscure, because in the main the journey commenced before man presumed to record any data whatever. It antedated the records of lost civilizations, and came down much after the manner in which a robin teaches its young to eat a worm. Who can tell the number of lives lost in the experimentation that finally led to the separating of the poison that exists in the tapioca plant from the wholesome starch food known as tapioca? Who knows the number of deaths preliminary to man's differentiating between the poisonous and the edible fungi, which is yet a problem, for in this field deaths often occur? The story of how the acrid arums came to be utilized by primitive people so as to become foods, or of the discovery of the distinction between the edible fish and flesh and forms of flesh and fish unwholesome, is as obscure as the experiments that led to the utilization of innocuous weeds as foods. Somewhere in Nature's climes all food plants are, or once were, weeds. To find their value as nutrients demands experiment which establishes some as useful when *they* become known as foods. So recent comparatively, is the sad proving of the attempt to eat as a pot herb one of America's new plants, as to have fixed the term *Jamestown Weed* to the plant which the settlers of Virginia about Jamestown investigated to their sorrow and death. Man's search for food is a

[1] Do not infer that the author overlooks or condemns *animal* foods. This paper will not permit a consideration of that phase, but it may be briefly said that the use of animal food is but the utilizing of vital force that has been transferred to flesh from plants that the animal has eaten. Plant life is the great food storehouse of both carnivorous and herbivorous animals.

story still in process. There is yet a risk in some directions where persons uninformed partake of weeds that should be known as poisons. In England the "sow-bread" or bryonia claims each year its victims. The same is true of *Œnanthe crocata.* The wild parsnip is often eaten in America for parsnip, and death results. The terribly poisonous amanita is mistaken for the wholesome mushroom. Whole families sometimes perish; no antidote is known. And yet the weeds of the field, the plants of the desert and the forest, unquestionably offer untold food opportunities to the human family. Let us not forget that the luscious apple came from a knotty, astringent wild fruit, that the mother of the potato grows yet as an insignificant wild tuber in Mexico, and that but a generation back the tomato was considered poisonous and was cultivated merely as an ornamental plant.

Turn now to remedial plants. Who can even formulate the empirical wanderings that led to the discovery of the qualities of ipecac, nux vomica, opium, jalap, podophyllum, that are possessed of energies that may, if illogically used, make them poisons, or, if discreetly employed, yield kindly remedial agents? Who can trace the more difficult study that led to the discovery of the insidious, valuable qualities of less harsh agents, such as baptisia, aletris, hydrastis, collinsonia, macrotys, and that last valuable discovery of the past decade, echinacea, which but a few years ago was known only as a worthless Western weed? Who will next serve humanity in this field, or who can predict the name of the plant next to unfold its qualities? All that have been introduced are as yet empirical gifts to man in the sense that all these natural corrective agents have been established experimentally. The good of those yet to come must as surely be the result of empiricism. All that nourishes and conserves life, all that upbuilds structures and modifies the life current or prevents the abnormal destruction of tissue, reasoning from analogy and from rational thought has been the result of empirical gifts to mankind. The evolution was based on *experimentation* which leads to faith in that which has been evolved in the past mazes of a struggle for existence wherein as a rule no book record is preserved. The data of it all is lost.

The Natural Structure of Foods and Alteratives.—Among primitive lessons in food study is that of selection and differentiation between *parts* of natural bodies, be they vegetable or animal. Men do

not eat the thorn of the cactus or the root of the mandrake, but the fruit or juice of the one, and the fruit of the other. They do not eat the husk of corn or the shell of the almond, but their kernels. This is a familiar fact, seemingly self-evident, but some time in the past it too had to be learned by experiment. The tuber of the potato is food, not its top. Phytolacca sprouts are excellent greens, but the root is an acrid irritant. The flesh of the fruit that encloses the deadly nux vomica seeds, much as an orange seed is imbedded in its pulp, is eaten freely. All this has experience taught, and were it not for the personal instruction each man gets from those already informed, would, in each case, have to be learned anew.

Empiricism teaches that the bark of the cinchona, the inspissated juice of the poppy capsule, the root of ipecac, the fruit of calabar, the dried juice of the catechu are remedial alteratives. They produce changes in organs or in structures by their influence on nerve current or on vitalized matter. They are natural plant *structures*, which experience has taught, as a crude whole, can influence or conserve life *structures*.

Empiricism Extended in the Direction of Medicine.—Let us pass the evolution which in foods is giving us new forms and combinations of old food-stuffs to serve the palate and the eye, and turn our attention to therapy. Basing his reasoning on observed facts, the thoughtful modern physician, aided by the pharmacist, draws yet finer lines. With his foot on the pedestal empiricism has reared in the use of plants as a whole, he adds thereto another mite. He differentiates between the giving of certain remedial structures for disease names and the giving of them for disease expressions which accompany abnormal conditions that have given rise to such disease names. He learns that even though a fever may be always reduced by aconite, as established by more superficial observation, it is not best to give aconite in all expressions accompanied by fever. He learns that while cinchona is useful in "intermittents," it must be given only in certain stages of the affection. He learns that opium may be a friend or an enemy, dependent on symptoms, idiosyncrasies, and complications; that ipecac has two qualities, and when used in minute doses is useful in a direction that is the very antithesis of emesis, its first field. Such as this he learns by experimentation and observation, and such truths as this can be learned only by observation based on experimentation. He also discovers that given a proven

symptomatic condition, unless there be some exceptional counteracting influence, a known remedy will produce specific effects. The method by which all this is determined is empirical; the ultimate, when established, is considered a phase of scientific art.

The Demands of Science.—But the fact soon becomes apparent that medication for well-known and well-established symptoms is hazardous if one depends on Nature's varying vegetable crudities. As the husk and shell of plants vary their proportions to other parts of the plant, under the influence of seasons, sunshine and showers, likewise do the proportions and relationships of the intercellular structures of certain parts of the plants used in medicine vary. The farmer knows that one season a field of grain may consist of much straw and little oats, while the next year the grain may be heavy and the stalk light. Nor are all plants in a crop uniform. The tree that bears the heaviest load of foliage may be barren of fruit. The most stately cinchona tree may be covered with worthless bark. A small chestnut tree, loaded with fruit, may be overshadowed by a mighty chestnut bearing foliage only. This empiricism teaches. And so empiricism or observation led to the first attempt to make more uniform preparations from the crude parts used in medicine. Came then the crude extracts both fluid and solid, the infusions and decoctions.

Finally, only one hundred years ago, morphine was discovered. Quick followed quinine, and then other bodies of a similar nature. Now entered a new thought. These energetic chemically-constructed ultimates seemed to indicate that behind every natural remedy lay a definite something that could replace in therapy the parent structure. This one-sided conception held the thought and experiment of many talented men for a hundred years, it locks many to-day in its tenacious embrace and which has been carried by some to irrational extremes. That it was a natural line for enthusiasm to take is apparently supported by the aggressive energies of a few educts and products, such as the cathartic resins of jalap and podophyllum (which are in themselves complex structures), the energetic alkaloids, and a few other products which possess in themselves qualities to remind one of the parent structures. Thus it is that the conspicuous example, quinine and morphine, nearly one hundred years ago led to blanket theories (resinoids and alkaloids) which well nigh wrecked the Eclectic school half a century later, and which now distract and

pervert thought in the Regular school, until we observe that medical nihilism, too often the result of such medication, is fostered by continued disappointment in directions where *structures*, not *fragments*, dominate a drug.

The great mass of organic remedial agents has no one dominating definite structure capable of either isolation or of yielding, by chemical destruction, definite ultimates. In them the natural structures, without formula or equation, stand supreme in the face of the aggressive chemist, and both his constructive and destructive art. In the materia medica of intercellular structures, no one chemically-made fragment that can be broken out parallels the drug as a whole, if one knows the whole drug. Indeed, with the vast majority of valuable vegetable remedies, chemistry is inadequate to even *help* identify a drug through the reactions of any known quality possessed by either its chemically-made or chemically-isolated fragments. Scores of plant preparations that for half a century have been valued as remedies, may be mixed; and no chemist in the world can, by his art, identify any one drug of the mixture, or by means of a formula or equation or reaction, point to any therapeutical constituent present in the mixture. Inter-structural compounds exist, by their well-known *qualities* are they established in pharmacy and therapy, but a blank are they to the chemist's art.

The time of thousands of workers has been spent during the past century in the hope that a single thing picked out of a mighty whole can parallel the original structure. A worthy ambition is this, but one that led to the greatest disappointment this writer ever experienced in a loved scientific theory, which thirty years ago held his enthusiastic care, and thirty years ago was sadly relinquished. Unquestionable evidence taught that *fragments* created out of drugs by chemistry do not parallel the natural intermolecular structures that establish drugs as remedies.

Much of the present discouragement of Regular physicians is surely due to the use of fragments only. Unwisely they have ignored the claims of plant structures which in themselves are valuable in medicine, but are neglected and discarded because the test tube and reagent of the chemist cannot create from them bodies like unto the poisonous alkaloids, atropine, strychnine, morphine. These men seek the hurricane; the still, small voice has no part in such medication.

Eclectic thought comprehended the situation in the latter part of the last century, and through clinical experimentation came into possession of a great, rich field which the Regular physician had unwittingly relinquished. It turned toward the evolution of a standard form of clean remedies, as nearly devoid of common plant dirt as possible, which should parallel the natural drugs as a whole, not be a fragment only. The demands of exact Eclectic medication in which small doses of natural, preserved, soluble drug structures were to be used to meet definite symptoms, made necessary the greatest possible exactness and the kindliest manipulation looking to the perfection of these preparations. The fathers foresaw wisely that on this materia medica the life of Eclecticism depended. By the use of this materia medica came their opportunity to do well their work.

The Evolution of Structural Remedies.—The one school in American medicine that has given its thought, its culture, its aim in the treatment of disease by structural vegetable remedies is acknowledged to be the Eclectic school. Whilst free to use all remedial agents, be they animal, vegetable or mineral, its great field has been the development of our native American drugs. It has taken freely from the discoveries of the Regular and the Homœopathic schools, crediting them therefor; it has no less freely given to them. The ambition of the Eclectic has been to investigate, to discover, to demonstrate. With this worthy object, as the various American drugs were investigated, the therapeutical values of these drugs were given to the world. They were placed before the profession under the true names of the plants yielding them. Text-books, materia medicas, works on practice, descriptive both of the drugs and their action in disease, were written. Thus, the facts evolved were ever at the command of men of other schools, whose investigating care was chiefly given in other directions and whose study was chiefly directed towards other fields. The evolution of these Eclectic remedies has been clinical, experimental in human disease expressions (not on animals in health), by a rule which necessitated a long and circumspect study of each remedy. It is a clinical furthering of the empiricism of the past in which as a rule the natural energetic structure of a drug dissolved in an appropriate preservative menstruum, separated from inert matters as much as possible, is viewed as a *whole*, and then used as a *whole*. Due credit is given isolated substances in their useful places. Indeed, the credit of discovering those

most valued in American plant life is to be credited to Eclecticism. But we value above all the interstructural effect that comes from life-bound *structures* endowed with their full vital qualities, preserved in assimilable form. This vegetable Eclectic Materia Medica has been evolved by seventy-five years' study of organized plant structures. To attempt to parallel these remedies by crudities we have left behind generations ago, or by fragments broken out of them, is as illogical as to attempt to use the decomposition products of albumen as a food where experience has proven the value of albumen as a whole. On the use of these valuable structures has the therapy of our school been established, both as to its indications and dosage. It is a therapy and a materia medica that now is increasingly sought, and is greatly needed by the physicians of other schools, whose eyes I believe are at last longingly directed toward the fruit borne by the tree of Eclecticism, in this, its last quarter of nearly a century of patient life.

VANILLIN IN ITS BEHAVIOR TO THE FORMALDEHYDE TESTS.[1]

By Charles H. LaWall.

The accuracy and reliability of any test or analytical method is directly proportionate to the knowledge which has been acquired concerning the means of distinguishing other substances which are liable to be confused with it on account of the similarity of the reaction.

The possibility of error is much smaller in the field of inorganic work, where schemes have been worked out for the separation of all known substances of this class; but in the department of organic chemistry, where the large number and complex constitution of most of the bodies render the application of any definite scheme of separation and identification almost impossible except for a very few substances, the chemist is compelled to rely upon certain reactions known as color reactions in identifying most organic bodies when they are present only in small amounts or mere traces.

The fact that in many instances color reactions of a similar nature are produced by different bodies, often due to remote chemical rela-

[1] Read at the meeting of the Pennsylvania Pharmaceutical Association, June, 1905, and contributed by the author.

tionship, is usually borne in mind by the careful worker in this field of chemistry, and it is customary to apply all of the known tests for the identification of an organic body before deciding definitely regarding it.

A sample of ice-cream was recently brought to the author of this paper for examination, with the information that it had been reported to contain formaldehyde. An examination by three well-known methods apparently indicated the unmistakable presence of formaldehyde. These methods were the Hehner contact test, the resorcinol-sulphuric acid contact test and the phenol-sulphuric acid contact test. As the author is in the habit of always applying the phenylhydrazine test, this test was applied with negative results, and a further application of the phloroglucol, resorcinol-soda, and hydrochloric acid tests also gave negative results. The flavor of the ice-cream was easily recognized as vanilla, and vanillin being an aldehyde, and thus indirectly related to formaldehyde, it was considered advisable to make some experiments with this substance with a view to ascertaining whether it gave similar reactions to formaldehyde with those tests which had indicated the presence of that substance.

A solution of vanillin, $\frac{1}{1000}$, was made up and employed in the various tests, and it was found to produce color reactions in all of the zone tests which were either identical in appearance with the colors produced by known solutions of formaldehyde which were tested at the same time, or were so close a resemblance as to render comparison necessary in order to distinguish them.

A sample of milk was then flavored with the vanillin and distilled and the reactions applied to the distillate with similar results.

Further investigation of the subject showed that artificial vanillin and the vanillin contained in an extract made from the genuine vanilla bean behaved in exactly the same manner, and that unless the phenylhydrazine, phloroglucol, or one of the other tests mentioned as not producing the reaction, were applied, the presence of formaldehyde in the solution would unhesitatingly be affirmed.

It was considered desirable to know in this connection whether coumarin, which is sometimes associated with vanillin in the cheaper extracts, would produce similar results, but the results with every one of the tests as applied to coumarin were entirely negative.

The following table of experiments upon a number of the sub-

stances examined in this investigation show the comparative results which were obtained:

	Milk.	Milk and Formaldehyde $\frac{1}{20000}$	Formaldehyde. $\frac{1}{20000}$	Coumarin $\frac{1}{1000}$	Vanillin $\frac{1}{1000}$	Milk with Vanillin $\frac{1}{1000}$
Phenol test	no reaction	pink zone	pink zone	no reaction	pink zone	pink zone
Resorcinol test	" "	" "	" "	" "	" "	" "
Hehner's test	" "	violet zone	violet zone	—	violet zone	violet zone
Phloroglucol test . .	—	—	cherry red color	" "	no reaction	—
Phenylhydrazin test . (*a*) with sodium nitroprusside . . . . (*b*) with potassium ferricyanide . . .	yellow —	green —	blue red	" " " "	" " pale red	yellow —
Hydrochloric acid test	brownish rose color	rose purple	—	—	—	brownish rose color
Resorcinal soda test .	yellowish brown color	red color	red color	no reaction	no reaction	yellowish brown color

Solutions containing $\frac{1}{1000}$, $\frac{1}{10000}$, $\frac{1}{100000}$, and $\frac{1}{200000}$, of vanillin were then prepared and all were found to give positive results with the resorcinol-sulphuric acid test, although the $\frac{1}{200000}$ dilution required some time for the rose-colored zone to appear and no definite reaction could be obtained with any higher dilution than this. The phenol-sulphuric acid test was not quite so delicate, being sensitive to $\frac{1}{100000}$, while the Hehner test was found to be sensitive in about this degree also.

THE PENNSYLVANIA PHARMACEUTICAL ASSOCIATION.

By Charles H. LaWall.

The twenty-eighth annual meeting of the Pennsylvania Pharmaceutical Association, which was held at Bedford Springs Hotel, Bedford Springs, Pa., on June 21st, 22d and 23d, was one of the best meetings, both in point of numbers and in the interest displayed in the business sessions, of any that have been held in recent years.

The first or opening session was held on Tuesday afternoon in the assembly room of the hotel. This session was called for the purpose of expediting the work of the convention by transacting many of the routine matters in advance of the opening session, which is always held on Tuesday evening. The secretary's report was pre-

sented, which showed that there had been over 900 notices sent out for the present meeting. The treasurer's report was presented by Mr. J. L. Lemberger, of Lebanon, and showed a total of 430 members in good standing, with 509 members who had not yet been heard from, most of whom only owed for the current year, however. The treasurer's report also showed that the association has a cash balance of over $1,500, which is the highest ever recorded.

The report of the executive committee was presented by the chairman, Mr. Griffiths, of Johnstown, and dealt mainly with the subject of increasing the membership.

The reports of delegates to the various associations were then heard. Mr. LaWall, the delegate from the New Jersey Association, presented the greetings from that association, after which the report of the Committee on Papers and Queries was presented by the chairman, Mr. LaWall, who stated that about thirty papers had been secured, many of which were of great scientific value, and that he desired time enough to present them in their entirety, instead of reading most of them by title, as is sometimes done.

Mr. John Wallace, of Newcastle, presented the report of the Legislative Committee, which showed that this committee had been instrumental in passing the Prerequisite Law and the Fruit Syrup Bill, and had exerted its influence against the Patent Medicine Bill, which had been introduced into the House, which if passed would have worked great hardships upon the druggists, but which they had succeeded in having referred back to the committee, where it remained.

The report of the Pharmacy Board was read by Secretary Miller for Mr. Charles T. George, the Secretary of the Board, after which Mr. Charles Leedom, of Philadelphia, presented the report on Trades Interests, a long report containing several recommendations, and which was referred to the Committee on President's Address for consideration.

The Entertainment Committee then presented an outline of the program which had been arranged for the pleasure of the members.

An Auditing Committee, consisting of Messrs. Blair, Thomas and Grohman, was then appointed, as well as a Nominating Committee, of Messrs. Siegfried, Utech, Lee, Horn and Gorgas.

Mr. D. J. Thomas, of Scranton, then presented the report of the Committee on Adulterations, which was a comprehensive piece of

work in every respect, and which will prove to be a valuable addition to the literature on the subject.

A committee was appointed to discuss ways and means of obtaining funds for next year's entertainment, and consisted of Messrs. Cliffe, Bransome and Lemberger.

The first formal meeting of the association was held in the assembly room of the hotel, on Tuesday evening, at 8 o'clock, and was opened by prayer by the Rev. H. B. Townsend. The local secretary, Mr. Marcy, then introduced Burgess Jordan, of Bedford, who made a pleasant speech of welcome, which was responded to in behalf of the members by W. O. Frailey of Lancaster, and especially in behalf of the ladies by Mrs. W. F. Horn, of Carlisle.

First Vice-President Wray then took the chair while President Koch presented his annual address. In his address President Koch began by referring to the Prerequisite Law, which had been recently passed, and stated that it marked a new era in the history of pharmaceutical education, inasmuch as it now enabled the colleges of pharmacy to do that which they had long desired but were never able to do—raise the preliminary requirements. He said that in an important matter of this kind the Board and the colleges should be in perfect harmony to achieve the best results, and that the elevation of the standard would necessarily have to be gradual and not revolutionary. He also referred to Section 6 of the present Pharmacy Law, which allows the sale of medicines by grocery and department stores, and recommended its repeal. The registration of apprentices and the ownership of the prescription, which latter question has recently been decided in North Carolina by legislative enactment, were also referred to the Legislative Committee for their consideration, with a view of obtaining the necessary legal enactment. He commended the Legislative Committee particularly upon the work which had been done during the past year, not only along the line of obtaining beneficial legislation, but also in preventing obnoxious legislation. He re-endorsed the Mann Bill and recommended that its passage be secured at as early a date as possible. The N.A.R.D. was referred to in commendatory terms, and the American Pharmatical Association was also endorsed unhesitatingly, and attention was called to the September meeting of that body in Atlantic City, and the fact that less than 4 per cent. of the druggists of the United States were members of the body. The membership of the State

Association formed the closing portion of the president's address, which, upon motion of Mr. Lemberger, was accepted and referred to a committee consisting of Messrs. Lackey, Thomas, Heck, Wallace and Frailey.

Professor Remington then addressed the meeting upon the subject of the new Pharmacopœia, a copy of which he exhibited as being an advance copy of the first edition which would be out in several weeks. He described many of the difficulties which the Revision Committee have labored under, which have contributed to delay the completion of the work, and described some of the points of difference between the old and the new editions and referred to the various styles of binding in which it would be issued.

On Wednesday morning the Association convened at 10 o'clock and the reading of the minutes of the previous meeting was followed by the sending of congratulatory messages to the other State Associations which were in session at the same time. The Committee on Time and Place of Next Meeting then reported in favor of Glen Summit, near Wilkesbarre, June 26, 27, 28, 1906, which report was received and unanimously adopted. The reports of delegates to other associations were then heard, after which the chairman of the Committee on Papers and Queries took charge and the reading of papers was begun.

The first paper read was "The Awakening of the Pharmacist," by B. E. Pritchard, and was followed by three papers in answer to Query No. 17, "Is the N.A.R.D. a Scheme to Get Something for Nothing?" by W. O. Frailey, J. Leyden White and T. H. Potts. These papers elicited a discussion which lasted during the remainder of this session, in which many of the statements were warmly debated. The discussion was participated in by Messrs. Redsecker, Emanuel, Lowe, Apple, Rehfuss, Millener, W. F. Horn, Pritchard, McIntyre, Walton and Wray.

The second session on Wednesday was opened at 3 P.M. and after hearing a long report from Mr. M. N. Kline, the delegate to the N.W.D.A. and the Proprietors' Association, the reading of papers was again resumed. The first paper read at this session was entitled "Rules for Prescription Filling," by E. F. Cook, and was read by Dr. C. B. Lowe, in the absence of the author. This paper was discussed by Mr. H. C. Blair, who described the method of filling and checking prescriptions which has been in use in his store for so many years.

Mr. Theodore Campbell, of Overbrook, then read two papers, one on "A Method of Advertising," and the other "A Check on Receipted Bills." R. H. Lackey then described a new prescription difficulty which had recently come under his observation, after which Prof. Joseph P. Remington read a paper on the "Prerequisite Law."

Dr. C. B. Lowe read a paper on "Drug-store Experience," which was followed by a paper on "The Use of the Mimeograph in Pharmacy," by E. F. Cook, which was read and explained by Prof. F. P. Stroup.

A paper by H. F. Ruhl, in answer to a number of queries, led to an interesting discussion and was followed by a paper entitled "The Two Windows Which Sold the Goods," by M. W. Bamford, of Reading.

Mr. Emanuel then read a long paper in answer to Query No. 18, concerning the lack of "Professionalizing Tendency of the American Pharmaceutical Association."

The final business session of the week was held at 10 A.M. Thursday. The committee appointed to report upon a plan for financing the entertainments reported a plan which was referred back to them for further consideration.

The Nominating Committee reported the following nominations: President, D. J. Thomas, of Scranton; First Vice-President, S. A. Stright, of Braddock; Second Vice-President, Albert Cliffe, of Ridgway; Treasurer, J. L. Lemberger, of Lebanon; Secretary, J. A. Miller, of Harrisburg; Local Secretary, G. P. Raser, Wilkesbarre. Executive Committee, W. E. Lee, Philadelphia, Chairman; L. L. Walton, Williamsport, and Croll Keller, Harrisburg. Upon motion of Mr. Redsecker, of Lebanon, Mr. Charles H. LaWall, the chairman of the Committee on Papers and Queries, was directed to cast the affirmative ballot for all of the nominees, which was accordingly done.

The Committee on President's Address then presented a report containing a number of recommendations which were discussed seriatim and adopted, after which the report was adopted as a whole.

Mr. P. H. Utech then read a paper on "The Nostrum Evil," which was followed by a paper by F. S. Nagle on "The Declining Art of Prescribing." Mr. W. L. Cliffe then presented a set of resolutions advocating the erection of a bronze monument in the grounds

of the Smithsonian Institution in Washington, D. C., to William Procter, Jr., the Father of American Pharmacy. The American Pharmaceutical Association, which has already inaugurated the work, was named as the custodian of the fund, and a committee of five was directed to be appointed by the president to confer with the A. Ph. A. Committee and raise subscriptions. President Koch appointed the following members of the committee: Prof. Henry Kraemer, C. W. Hancock, William McIntyre, David Horn, and Prof. J. P. Remington.

Several papers were then read, after which the meeting adjourned until 8 o'clock Thursday evening, when the officers were installed with the usual ceremonies.

A number of interesting papers were read at the last session, a few of which were read by title.

The entertainment features of the Association were quite up to the usual high character and contributed largely to the enjoyment of the meetings by those who were in attendance.

PHILADELPHIA COLLEGE OF PHARMACY.

The quarterly meeting of the members of the College was held June 26th, at 4 P.M., in the Library, the President, Howard B. French, presiding. Twelve members were present.

The minutes of the annual meeting, held March 27th, were read and approved.

The minutes of the Board of Trustees for March 7th and April 4th were read by the Registrar and approved.

Report of Committee on Membership.—From this report it is learned that the active membership reside mainly in Philadelphia and the nearby towns. Other sections of Pennsylvania are represented by fifteen members, and sixteen other States are represented by thirty members.

Of the associate members four reside in Pennsylvania and thirteen in other States; the honorary members numbering forty-two, and the corresponding members numbering thirty-one.

A number of names were reported as having "forfeited membership" by non-payment of annual dues for three years.

Report of Committee on Necrology.—Active members deceased during the year numbered four: William J. Jenks, William Weight-

man, Julian Fajans, M.D., and Henry N. Rittenhouse. Honorary members deceased: Alfred H. Allen, Frederick Hoffmann, A. B. Prescott, Alfonso Herrera, Helen A. Michael, Albert Hilger. Corresponding member deceased: C. R. C. Tichborne.

The delegates to the Pennsylvania Pharmaceutical Association, by its Chairman, Prof. C. B. Lowe, presented a brief report, in which they told of the very successful meeting recently held at Bedford Springs. Twenty-eight papers were presented. D. J. Thomas, of Scranton, was elected President. The next meeting is to be held at Glen Summit, June 26–28, 1906.

Announcement was made of the death of Mrs. Procter, widow of the late William Procter, Jr. Also of the death of Henry N. Rittenhouse, a member of the College since 1854. He served many years on the Committee on Publication, and also for some years on the Board of Trustees.

The resignation of Edwin W. Murphy, of Macon, Miss., was accepted.

APPOINTMENTS.

Committee on Nominations.—Joseph W. England, Joseph P. Remington, Henry Kraemer, Jacob M. Baer and O. W. Osterlund.

Committee on Necrology.—Henry Kraemer, Samuel P. Sadtler and Gustavus Pile.

Historical Committee.—George M. Beringer, Henry Kraemer, Thomas S. Wiegand.

Delegates to American Pharmaceutical Association. — Henry Kraemer, Joseph P. Remington, Samuel P. Sadtler, C. B. Lowe and M. I. Wilbert; as alternates, M. N. Kline, E. M. Boring, Miers Busch, W. L. Cliffe and J. W. England.

ABSTRACTS FROM MINUTES OF THE BOARD OF TRUSTEES.

March 7.—Committee on Library reported a number of accessions to the Library by donation, purchase and exchange. John F. Hancock, of Baltimore, Md., elected to associate membership.

April 4.—M. N. Kline elected Chairman of the Board of Trustees; George M. Beringer, Vice-Chairman; Jacob S. Beetem, Registrar. Committee on Instruction recommended lengthening the first and second year courses and entrance requirements, detailed at length in the eighty-fifth annual announcement just issued.

C. A. WEIDEMANN, *Secretary.*

HENRY TROTH,
1794–1842.